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TRENDS IN LAND USE IN THE UMPQUA BASIN, OREGON

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COLUMBIA RIVER BASIN PROJECT FOR WATER SUPPLY AND WATER QUALITY MANAGEMENT

TRENDS IN LAND USE IN THE UMPQUA BASIN, OREGON

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Springfield VA 22151

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U. S. DEPARTMENT OF HEALTH, EDUCATION AND WELFARE
Public Health Service
Region IX

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This working paper contains preliminary data and information primarily intended for internal use by the Columbia River Basin Project staff and cooperating agencies. The material presented in this paper has not been fully evaluated and should not be considered as final.

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TRENDS IN LAND USE IN THE UMPQUA BASIN, OREGON

INTRODUCTION

The Umpqua River Basin is practically synonymous with Douglas County, Oregon. It has an area of a little less than 5,000 square miles, and drains west from the crest of the Cascade Mountains through the Coast Range to the Pacific Ocean. The valleys are narrow, with no broad, flat areas. Summers are hot and dry, winters cool and wet. Most of the water supply comes from snow stored in the forests of the high Cascade Mountains.

LAND CLASSIFICATION

The 3,239,000 acres of Douglas County are classified as follows, according to the U. S. Department of Agriculture Columbia River Basin Agricultural Program Report:

Ownership	Forest	Range	Irrig.	Non-Irrig.	Other	Total
			Area in Acres			
Federal	1,631,000	11,000	-	-	10,000	1,652,000
Local Gov't	41,000	37,000	-	-	2,000	80,000
Private	1,180,000	150,000	4,000	153,000	20,000	1,507,000
Total	2,852,000	198,000	4,000	153,000	32,000	3,239,000

This shows the situation as of 1951. The Oregon Soil and Water Conservation Needs Inventory with 1958 data shows irrigated cropland increased to 13,000 acres. Definitions are sufficiently different to make comparisons from the two data sources difficult; but forest land appears to be about the same. Urban and built-up areas, part of the "Other" category, have raised the "Other" total to 55,000 acres now. Much of what the 1951 classification called "Range" was called "Pasture" in the 1958 inventory, and it is difficult to work out just what has happened to it. Some is apparently

in "Cropland" and has moved into the "Irrigated" category.

THE SITUATION ON FOREST LAND AND IN FOREST PRODUCTS

The allowable cut on the Umpqua National Forest is 380,000,000 board-feet annually, of which 20,000,000 board-feet are in thinnings and salvage. The present cutting rate is at this allowable level. Within the next 20 years the allowable cut will increase about 25 percent; most of the gain being from thinnings, better utilization, and better access that will permit more efficient salvage. The major private forest owners are all big companies that are in business on a sustained yield basis. The other big forest holding is in Bureau of Land Management hands; it has an allowable cut of close to 200,000,000 board-feet and is now at that level. No increase is expected.

Since 1948 the total timber cut for Douglas County has been above one billion board-feet each year, reaching a peak in 1956, and dropping to about one and a quarter billion board-feet by 1961. Even this represents an over-cut; the sustained yield on a present use basis is estimated at about three-quarters billion board-feet. As will the allowable cut on the National Forest, this will increase about 25 percent within the next 20 years.

Unfortunately, the present saw-milling capacity in Douglas County is double the sustained yield of the forest. In the past five or six years many small operators have gone out of business; only a quarter of those are left that were working in the 1951-54 period. Competition will eventually force out all the mills that must rely entirely on government timber. However, a pulp mill may be expected to be located in the county within the next twenty years; many of the private companies are already producing chips for pulp. The mill probably will be near Winchester on the North Umpqua, or

on the main river down below the junction of the North and South Umpqua.

The market for the hardwoods found principally in the foothills (Including madrone, tan oak, black oak, maple and alder) is improving; more are going both to pulp and to lumber. There will be an increase in small turnery for the production of handles, etc.

There is, surprisingly enough, a possibility for a pulp mill in the uppermost part of the watershed, at 4,500 feet elevation near Lemolo Lake at the head of the North Umpqua River. California - Oregon Power Company is producing electric power there now. There is a large supply of high quality water available from big springs in the vicinity. There are 20,000 acres of lodgepole pine and mountain hemlock and white fir in the immediate surrounding area as a source of chips. A new all-year highway serves the area. Pumice beds fifty feet deep blanket the area (it is not far north of Crater Lake) and afford a possibility for filtration of waste liquors at some distance from streams. Full treatment of wastes and removal of excess nutrients before release would be a necessity, for the North Umpqua is both an important salmon and steelhead producing stream and the source of the water supply for the City of Roseburg. It is likely that this mill will be installed within fifty years.

So far, no insect epidemics have required widespread spraying for control. Some herbicides have been applied by aerial spray for brush control; and it is expected that this will continue. Of the 10,000 acres cut over each year, perhaps 1,000 need brush control treatment to permit adequate tree crop regeneration. Most of this work is in the middle and lower parts of the watershed. Antibiotic sprays are used on young sugar pine plantations

for blister rust control, but this is done on the ground tree by tree.

Fertilizers have been applied to older plantations in areas of heavy deer population to put succulent growth on the larger trees and attract the deer away from the young plantings. Agricultural rates of application, up to 800 pounds per care, have been used; but the total area so treated has been very small. Fertilizer application is not expected to become widespread on forest lands.

Algal blooms have occurred in Diamond Lake at the head of the watershed since before recreational development of the area. Nutrients causing the blooms are believed to come from the swamp drainage feeding the lake. The lake is shallow and warms up readily. The California-Oregon Power Company also has an algae problem, in its canals from Lemolo Lake where growths may cut down the flow by 20 percent. The company gains control by shutting off the flow, drying out the canals, and mechanically brushing off the algae. There is no evidence that any herbicide that would affect the Roseburg water supply has ever been used.

The Bureau of Land Management in its lower-lying forest lands uses aerial seeding of mustard to provide a quick cover-crop on areas subjected to hard burns. Area so treated each year is small, but continuation of this soil stabilization and erosion control practice will reduce sediment loads in streams draining the burns.

Some 1,500 miles of timber access road have already been built on the Federal lands, and about 4,000 miles more remain to be built. This future road construction even at best will cause considerable soil and stream channel disturbance and create sedimentation problems.

Recreation use of upstream watershed areas is rapidly increasing. At Diamond Lake, always a popular spot, there were 3,000 boats and 10,000 people on opening day of trout season 1962. That is one boat and three people per acre of lake. For the season, the lake had 125,000 visitors, double the load of five years earlier. It is planned to open up a ski area with a lift near Mt. Bailey just west of Diamond Lake, and this will bring in year-round use. Most of the use would be concentrated in the ski and fishing seasons, December to February, and May to October. New recreation area developments, including camp and picnic grounds and swimming holes, are being installed throughout the basin in anticipation of continued increasing use.

Fisheries appear to be decreasing. Both trout and summer steelhead populations have dropped very low; but fishing pressure is constantly increasing. Now most of the recreation use attracted by the fishery goes to Diamond Lake, which accounts for about three-quarters of all forest-based recreation.

THE SITUATION ON CROPLAND

Cropland is for this discussion defined to include the range areas which are a basic part of the agriculture of the basin and which are, to some degree, in a state of interchange with land cultivated for crops.

Douglas County has more animal unit months of grazing than any other county in the state. But though livestock numbers are increasing, the human population is decreasing, there being about 1,000 fewer people in 1962 than recorded in the 1960 census. Farm units are becoming larger.

The 1962 irrigated area is a little over 14,000 acres; about as much as can be irrigated without supplemental storage to make additional water available. Water rights are already over-appropriated on every tributary; waters of the South Umpqua River are over-appropriated about 25 times. These many appropriations are for mining, industry, irrigation and domestic use;

and fortunately are applied at different seasons.

Potential pasture or range area amounts to about 500,000 acres; to reach this potential would mean converting a little marginal cropland and a lot of grazed forest range. The forest that would be converted is woodland savanna with white oak and madrone (and occasionally some yellow pine) tree cover and brush and grass understory. In the conversion process the forest and brush are cut down and burned, arsenical stumpkillers are applied to the hardwoods, 2-4-5-T spray is applied to the brush, a cover crop with limited fertilization is put in, and in the second year there is complete cultivation, heavy fertilization, seeding to pasture grasses and legumes, and irrigation. Fertilization includes addition of 5,000 pounds of limestone or equivalent per acre every five years; and a minimum of 300 pounds of 16:20 N-P formulation each year. A net of 40 pounds N and 60 pounds P, and some K is needed per acre, dry or irrigated. The use of single superphosphate has increased five times in the last ten years. Very little nutrient leaching occurs as there is little or no return flow from irrigation and surface erosion is greatly reduced under proper pasture management. Most of this development will take place on the lower hills and valley edges; any problems from nutrients or toxins moving from treated areas will develop in the middle and lower courses of the tributaries.

The livestock industry will show a large increase as the pasture conversions are made; and the conversions are being made at about 15,000 acres a year. However, some of what is at present the best pasture land will likely be converted to more intensive use for beans and row crops. Floodplain areas south of Roseburg are already used for high-value intensively farmed truck crops; even rural zoning is not likely to change this pattern, though it may

prevent residential build-up in flood hazard areas. Cropland is being lost to roads (about 2,000 acres in Douglas County in recent years) and to suburban residential development along roads and along streams.

Expansion of irrigated area requires either application of less water per acre, or the development of more water supply. Several water storage projects are being studied; altogether they could furnish water to irrigate about three times the present 14,000 acres irrigated. Reservoir storage projects will also help meet expanding recreation demands.

Irrigation use averages 18 to 20 inches depth each year, though alfalfa for pasture will use up to 30 inches. Grass on sprinkler irrigated pasture and most crops need about 18 inches to assure reasonable yields. With the increasing development of improved pasture will come irrigation water management with more efficient sprinkler applications timed according to the requirements of the soil.

POLLUTION PROBLEMS AND FORECASTS

Bean acreage is now increasing in the Roseburg area, and the crop goes to Springfield for processing. As the flood control and irrigation projects are installed, there will be more bottomland put to irrigated, intensively farmed cannery crops. Within 50 years we may expect vegetable processing industry to be established at or near Roseburg, probably on the South Umpqua. Within 25 years we may expect a meat-processing plant, attracted by the rapid expansion of the livestock industry. These will present additional waste disposal problems and water pollution hazards.

Urban and suburban expansion will continue, stimulated both by the above-mentioned industrial developments and by the northward movement of

people who find California too crowded. Because of the lumber industry Roseburg is a high wage area, and this attracts people too. One of the "community colleges" is expected to be established there in the near future, and this will require additional urban development. All this adds up to greatly increased domestic sewage and garbage loads to be disposed of. Frontage lots along the river are being developed for permanent residence; because of peculiarities of soil structure, the septic tanks serving the developments discharge rapidly to the river and are creating a serious pollution problem both in the river and by contaminating the groundwater tapped by wells for domestic supply.

There are no irrigation return flow drains, and consequently no significant return flow problems as yet. However, where tile drains are installed - and more can be expected - the rapid removal of water from levels near the soil surface certainly presents a real hazard of rapid removal of fertilizers and pesticides that may be added to soil or crop under irrigation.

Mineral potential of Douglas County is fairly high. A large nickel mine is now in operation at Riddle on Cow Creek. There are quicksilver mines - now inactive - in the Calapooya drainage. Several properties that have been worked in times past contain sulfide deposits of gold, silver, copper, and zinc. There are several chromite deposits, some of whichhave recently been worked. Subbituminous coal beds and some sulfur deposits also occur in various places. With increasing demand, we may expect more of these minerals to be exploited; and the process will develop some waste disposal problems and some serious stream pollution hazards. Most of these developments are high up in the watersheds; the pollution load would be injected near the heads of the streams.

As indicated in previous sections, the only forest-based industry expected to enter that would have an impact on water pollution is a pulp mill. There will very probably soon be a mill somewhere in the basin to take advantage of the pulpwood afforded by thinnings and better waste utilization. This mill will have wastes that may present a serious pollution hazard if their disposal is not carefully planned in advance.

Timber access road construction and logging operations will continue to put sediment into streams; but the load should gradually lessen as construction and logging practices are improved. This sediment load will be added in the upper reaches of the affected streams.

Outdoor recreation will increase rapidly; it will bring domestic sewage and garbage disposal problems to upstream watershed areas, with attendant water pollution hazards. There will also be increased hazard of oil and gasoline contamination of streams and lakes as boating use increases. Increased personal contact with the water by swimmers and boaters and water skiers and fishermen, will increase hazards of bacterial pollution. Again, much of the pollution load will be added in the upper reaches of the streams.